Triangulation sensor (SbR)
OQT150-R100-2EP-IO

- Miniature design with versatile mounting options
- Multi Pixel Technology (MPT) - flexibility and adaptability
- Reduction of device variety - several switch points within one sensor
- Reliable detection of all surfaces, independent of color and structure
- Low sensitivity to target color
- IO-Link interface for service and process data

Switching diffuse mode sensor with measurement core technology, 150 mm detection range, red light, IO-Link, 2 x push-pull output, 2 m fixed cable
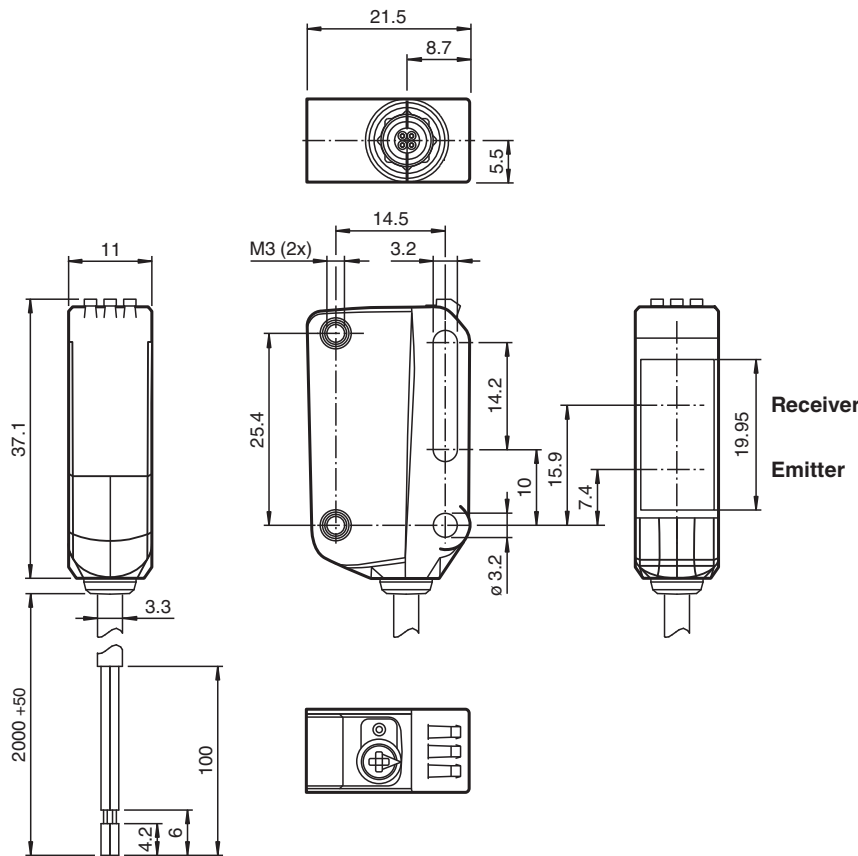
Function

The R100 series miniature optical sensors are the first devices of their kind to offer an endto- end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.
The entire series enables sensors to communicate via IO-Link.
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.
The use of Multi Pixel Technology gives the standard sensors a high level of flexibility and enables them to adapt more effectively to their operating environment.

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Dimensions

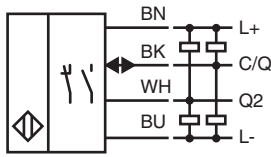## Technical Data

General specifications

Detection range	5 ... 150 mm
Detection range min.	5 ... 20 mm
Detection range max.	5 ... 150 mm
Adjustment range	20 ... 150 mm
Reference target	standard white, 100 mm x 100 mm
Light source	LED
Light type	modulated visible red light
LED risk group labelling	exempt group
Black-white difference (6 %/90 %)	< 5 % at 150 mm
Diameter of the light spot	approx. 10 mm at a distance of 150 mm
Opening angle	approx. 4 °
Ambient light limit	EN 60947-5-2 : 30000 Lux

Functional safety related parameters

$MTTF_d$	600 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

Operation indicator	LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode

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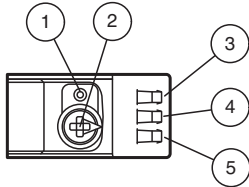## Technical Data

Function indicator			LED yellow: constantly on - switch output active constantly off - switch output inactive
Control elements			Teach-In key
Control elements			5-step rotary switch for operating modes selection
Electrical specifications			
Operating voltage		U_B	10 ... 30 V DC
Ripple			max. 10 %
No-load supply current		I_0	< 25 mA at 24 V supply voltage
Protection class			III
Interface			
Interface type			IO-Link (via C/Q = BK)
IO-Link revision			1.1
Device profile			Smart Sensor
Device ID			0x110801 (1116161)
Transfer rate			COM2 (38.4 kBit/s)
Min. cycle time			2.3 ms
Process data width			Process data input 2 Bit Process data output 2 Bit
SIO mode support			yes
Compatible master port type			A
Output			
Switching type			The default setting is: C/Q - BK: NPN normally open, PNP normally closed, IO-Link Q2 - WH: NPN normally open, PNP normally closed
Signal output			2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected
Switching voltage			max. 30 V DC
Switching current			max. 100 mA , resistive load
Usage category			DC-12 and DC-13
Voltage drop		U_d	≤ 1.5 V DC
Switching frequency		f	217 Hz
Response time			2.3 ms
Conformity			
Communication interface			IEC 61131-9
Product standard			EN 60947-5-2
Approvals and certificates			
UL approval			E87056 , cULus Listed , class 2 power supply , type rating 1
Ambient conditions			
Ambient temperature			-40 ... 60 °C (-40 ... 140 °F) , fixed cable -25 ... 60 °C (-13 ... 140 °F) , movable cable not appropriate for conveyor chains
Storage temperature			-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications			
Housing width			11 mm
Housing height			37.1 mm
Housing depth			21.5 mm
Degree of protection			IP67 / IP69 / IP69K
Connection			2 m fixed cable
Material			
Housing			PC (Polycarbonate)
Optical face			PMMA
Mass			approx. 36 g
Cable length			2 m

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Connection

Assembly

1	Teach-in button
2	Mode rotary switch
3	Switch output indicator Q2
4	Switch output indicator Q1
5	Operating indicator
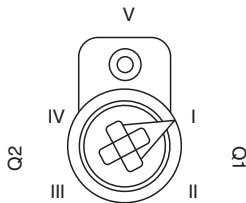
I	Switch output 1 / switch point B
II	Switch output 1 / switch point A
III	Switch output 2 / switch point A
IV	Switch output 2 / switch point B
V	Keylock

Characteristic Curve

Characteristic response curve

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Characteristic Curve

Detection ranges

Object colour

Object colour	Distance X [mm]
black	
grey	
white	

0   20   40   60   80   100   120   140   160
Distance X [mm]
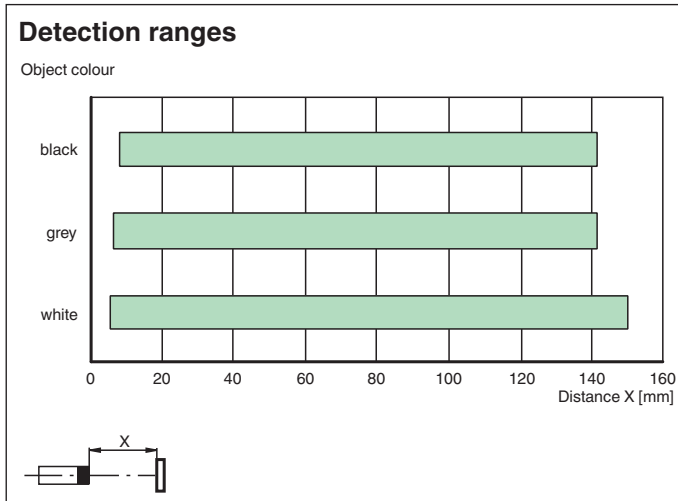
Accessories

	OMH-ML100-09	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	OMH-R10X-01	Mounting bracket
	OMH-R10X-02	Mounting bracket
	OMH-R10X-04	Mounting bracket
	OMH-R10X-10	Mounting bracket
	OMH-ML100-03	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	OMH-ML100-031	Mounting aid for round steel ø 10 ... 14 mm or sheet 1 mm ... 5 mm
	ICE2-8IOL-G65L-V1D	EtherNet/IP IO-Link master with 8 inputs/outputs
	ICE3-8IOL-G65L-V1D	PROFINET IO IO-Link master with 8 inputs/outputs
	ICE1-8IOL-G30L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE1-8IOL-G60L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE2-8IOL-K45P-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	ICE2-8IOL-K45S-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal

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Accessories

	ICE3-8IOL-K45P-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	ICE3-8IOL-K45S-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	IO-Link-Master02-USB	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

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Teach-In

You can use the rotary switch to select the relevant switching threshold A and/or B for teaching in for switch signal **Q1 or Q2**. The yellow LEDs indicate the current state of the selected output.

To store a threshold value, press and hold the "TI" button until the yellow and green LEDs flash in phase (approx. 1 s). Teach-In starts when the "TI" button is released.

Successful Teach-In is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs.

An unsuccessful Teach-In is indicated by rapidly alternating flashing (8 Hz) of the yellow and green LEDs.

After an unsuccessful Teach-In, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Different switching modes can be defined by teaching in the relevant distance measured values
for the switching thresholds A and B:

Single point mode:

Window mode:
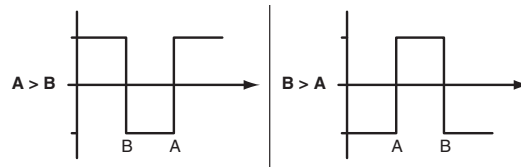
Every taught-in switching threshold can be retaught (overwritten) by pressing the „TI" button
again.

Pressing and holding the "TI" button for > 4 s completely deletes the taught-in value. The yellow and green LEDs go out simultaneously to indicate that this procedure has been completed. Successful resetting is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs.

Resetting to Factory Default Settings

Press the „TI" button for > 10 s in rotary switch position ‚O' to reset to factory default settings. The yellow and green LEDs go out simultaneously to indicate the resetting.

Resetting process starts when the "TI" button is released and is indicated by the yellow LED. After the process the sensor works with factory default settings, immediately.

OMT:
- Factory default settings switch signal Q1:
  Switch signal active, window mode
- Factory default settings switch signal Q2:
  Switch signal active, window mode

OQT:
- Factory default settings switch signal Q1:
  Switch signal active, BGS mode (background suppression)
- Factory default settings switch signal Q2:
  Switch signal active, BGS mode (background suppression)

Configuration

Configuring different operating modes via the IO-Link interface

The devices are equipped with an IO-Link interface as standard for diagnostics and parameterization tasks to ensure optimum adjustment of the sensors to the relevant application. Four different operating modes can be set, among other features:

Background suppression operating mode (one switch point):
- Detection of objects irrespective of type and color in a defined detection range. Objects in the background are suppressed.

active detection range

Background
suppression

Background evaluation operating mode (one switch point):
- Detection of objects irrespective of type and color against a defined background. Reliable detection of objects at close range

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(detection range >= 0 mm). The background serves as reference.

active detection range

Background evaluation

Single point mode operating mode (one switch point):
- Detection of objects irrespective of type and color in a defined detection range. Objects in the background are suppressed.
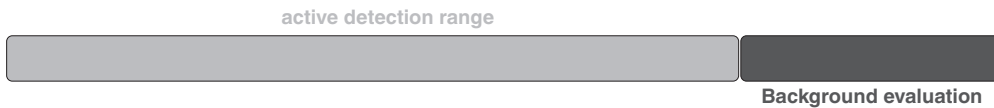- The switch point corresponds exactly to the set point.

active detection range

Background suppression

Window mode operating mode (two switch points):
- Detection of objects irrespective of type and color in a defined detection range. Reliable detection when object leaves the detection range.
- Window mode with two switch points.

active detection range

Foreground suppression **Background suppression**

Center window mode operating mode (one switch point):
- Detection of objects irrespective of type and color in a defined detection range. Sets a defined window around a given object. Objects outside this window are not detected.
- Window mode with one switch point.

active detection range

Foreground suppression **Background suppression**

Two point mode operating mode (hysteresis operating mode):
- Detection of objects irrespective of type and color between a defined switch-on and switch-off point.

active detection range

Output

Hysteresis

Output
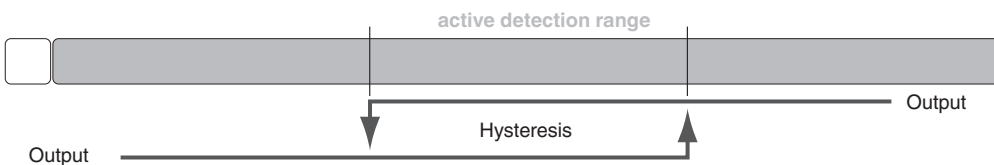
Inactive operating mode:
- Evaluation of switching signals is deactivated.

The associated IODD device description file can be found in the download area at **www.pepperl-fuchs.com**.

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Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 267075-100149_eng.pdf